

ABSTRACT OF THE DISCLOSURE

1 A bond joint and process of bonding metal parts to one another to form seamless, hollow
2 metal articles, particularly made from beryllium. Tooling is assembled to the parts, prior to hot
3 pressing, to cause pressure to be applied to flanges that extend peripherally from the parts. The
4 parts, assembled together with the tooling, are then subjected to hot isostatic pressing of the
5 flanges at a temperature of about 1700° F to 1750° F, and at a pressure of about 2000 psi to 2500
6 psi, for around 3 hours. The tooling surrounding the metal parts functions to limit the amount of
7 compression of the flanges. Articles formed by this process are particularly useful in space flight
8 applications because they are formed of a homogeneous material. This means that the articles
9 can operate under high pressure despite being subjected to temperature cycling. Strength of the
10 bond joint is enhanced because no filler metal is used. The absence of a filler metal also
11 eliminates any thermal stress problems as a result of differences in coefficients of thermal
12 expansion.